percent do (Breslau et al., 1998), but estimates are higher for particular types of trauma. For women who are victims of crime, one study found the prevalence of PTSD in a representative sample of women to be 26 percent (Resnick et al., 1993). The likelihood of developing PTSD is related to pretrauma vulnerability (in the form of genetic, biological, and personality factors), magnitude of the stressful event, preparedness for the event, and the quality of care after the event (Shalev, 1996).

The relative roles of biological, psychological, or social factors also may vary across individuals and across stages of the life span. In some people, for example, depression arises primarily as a result of exposure to stressful life events, whereas in others the foremost cause of depression is genetic predisposition.

Understanding Correlation, Causation, and Consequences

Any discussion of the etiology of mental health and mental illness needs to distinguish three key terms: correlation, causation, and consequences. These terms are often confused. All too frequently a biological change in the brain (a lesion) is purported to be the "cause" of a mental disorder, based on finding an association between the lesion and a mental disorder. The fact is that any simple association—or correlation—cannot and does not, by itself, mean causation. The lesion could be a correlate, a cause of, or an effect of the mental disorder.

When researchers begin to tease apart etiology, they usually start by noticing correlations. A correlation is an association or linkage of two (or more) events. A correlation simply means that the events are linked in some way. Finding a correlation between stressful life events and depression would prompt more research on causation. Does stress cause depression? Does depression cause stress? Or are they both caused by an unidentified factor? These would be the questions guiding research. But, with correlational research, several steps are needed before causation can be established.

If a correlational study shows that a stressful event is associated with an increased probability for depression and that the stress usually precedes depression's onset, then stress is called a "risk factor" for depression.[5] Risk factors are biological, psychological, or sociocultural variables that increase the probability for developing a disorder and antedate its onset (Garmezy, 1983; Werner & Smith, 1992; Institute of Medicine [IOM], 1994a). For each mental disorder, there are likely to be multiple risk factors, which are woven together in a complex chain of causation (IOM, 1994a). Some risk factors may carry more weight than others, and the interaction of risk factors may be additive or synergistic.

Establishing causation of mental health and mental illness is extremely difficult, as explained in Chapter 1. Studies in the form of randomized, controlled experiments provide the strongest evidence of causation. The problem is that experimental research in humans may be logistically, ethically, or financially impossible. Correlational research in humans has thus provided much of what is known about the etiology of mental disorders. Yet correlational research is not as strong as experimental research in permitting inferences about causality. The establishment of a cause and effect relationship requires multiple studies and requires judgment about the weight of *all* the evidence. Multiple correlational studies can be used to support causality, when, for example, evaluating the effectiveness of clinical treatments (Chambless et al., 1996). But, when studying etiology, correlational studies are, if possible, best combined with evidence of biological plausibility

[5] Chapter 4 contains a fuller discussion of the relationship between stress and depression. In common parlance, stress refers either to the stressful event or to the individual's response to the event. However, mental health professionals distinguish the two by referring to the external events as the "stressor" (or stressful life event) and to the individual's response as the "stress response."

(IOM, 1994b).[6] This means that correlational findings should fit with biological, chemical, and physical findings about mechanisms of action relating to cause and effect.

Biological plausibility is often established in animal models of disease. That is why researchers seek animal models in which to study causation. In mental health research, there are some animal models—such as for anxiety and hyperactivity—but a major problem is the difficulty of finding animal models that simulate what is often uniquely human functioning. The search for animal models, however, is imperative.

Consequences are defined as the later outcomes of a disorder. For example, the most serious consequence of depression in older people is increased mortality from either suicide or medical illness (Frasure-Smith et al., 1993, 1995; Conwell, 1996; Penninx et al., 1998). The basis for this relationship is not fully known. The relationship between depression and suicide in adolescents is presented in Chapter 3.

Putting this all together, the biopsychosocial model holds that biological, psychological, or social factors may be causes, correlates, and/or consequences in relation to mental health and mental illness. A stressful life event, such as receiving the news of a diagnosis of cancer, offers a graphic example of a psychological event that causes immediate biological changes and later has psychological, biological, and social consequences. When a patient receives news of the cancer diagnosis, the brain's sensory cortex simultaneously registers the information (a correlate) and sets in motion biological changes that cause the heart to pound faster. The patient may experience an almost immediate fear of death that may later escalate to anxiety or depression. This certainly has been established for breast cancer patients (Farragher, 1998). Anxiety and depression are, in this case, *consequences* of the cancer diagnosis,[7] although the exact mechanisms are not understood. Being anxious or depressed may prompt further changes in behavior, such as social withdrawal. So there may be social consequences to the diagnosis as well. This example is designed to lay out some of the complexity of the biopsychosocial model applied to mental health and mental illness.

Biological Influences on Mental Health and Mental Illness

There are far-reaching biological and physical influences on mental health and mental illness. The major categories are genes, infections, physical trauma, nutrition, hormones, and toxins (e.g., lead). Examples have been noted throughout Chapter 1 and earlier in this chapter. This section focuses on the first two categories—genes and infections—for these are among the most exciting and intensive areas of research relating to biological influences on mental health and mental illness.

The Genetics of Behavior and Mental Illness

That genes influence behavior, normal and abnormal, has long been established (Plomin et al., 1997). Genes influence behavior across the animal spectrum, from the lowly fruitfly all the way to humans. Sorting out which genes are involved and determining how they influence behavior present the greatest challenge. Research suggests that many mental disorders arise in part from defects not in single genes, but in *multiple* genes. However, none of the genes has yet been pinpointed for common mental disorders (National Institute of Mental Health [NIMH], 1998).

The human genome contains approximately 80,000 genes that occupy approximately 5 percent of the DNA sequences of the human genome. By the spring of 2000, the human genome project will have provided an initial rough draft version of the entire sequence of the human genome, and in the

[6] Other types of information used to establish cause and effect relationships are the strength and consistency of the association, time sequence information, dose-response relationships, and disappearance of the effect when the cause is removed.

[7] Anxiety and depression may in some cases be caused by hormonal changes related to the tumor itself.

ensuing years, gaps in the sequence will be closed, errors will be corrected, and the precise boundaries of genes will be identified.

In parallel, clinical medicine is studying the aggregation of human disease in families. This effort includes the study of mental illness, most notably schizophrenia, bipolar disorder (manic depressive illness), early onset depression, autism, attention-deficit/hyperactivity disorder, anorexia nervosa, panic disorder, and a number of other mental disorders (NIMH, 1998). From studying how these disorders run in families, and from initial molecular analyses of the genomes of these families, we have learned that heredity—that is, genes—plays a role in the transmission of vulnerability of all the aforementioned disorders from generation to generation.

But we have also learned that the transmission of risk is not simple. Certain human diseases such as Huntington's disease and cystic fibrosis result from the transmission of a mutation—that is, a deleteriously altered gene sequence—at one location in the human genome. In these diseases, a single mutation has everything to say about whether one will get the illness. The transmission of a trait due to a single gene in the human genome is called Mendelian transmission, after the Austrian monk, Gregor Mendel, who was the first to develop principles of modern genetics and who studied traits due to single genes. When a single gene determines the presence or absence of a disease or other trait, genes are rather easy to discover on the basis of modern methods. Indeed, for almost all Mendelian disorders across medicine that affect more than a few people, the genes already have been identified.

In contrast to Mendelian disorders, to our knowledge, all mental illnesses and all normal variants of behavior are genetically complex. What this means is that no single gene or even a combination of genes dictates whether someone will have an illness or a particular behavioral trait. Rather, mental illness appears to result from the interaction of multiple genes that confer risk, and this risk is converted into illness by the interaction of genes with environmental factors. The implications for science are, first, that no gene is equivalent to fate for mental illness. This gives us hope that modifiable environmental risk factors can eventually be identified and become targets for prevention efforts. In addition, we recognize that genes, while significant in their aggregate contribution to risk, may each contribute only a small increment, and, therefore, will be difficult to discover. As a result, however, of the Human Genome Project, we will know the sequence of each human gene and the common variants for each gene throughout the human race. With this information, combined with modern technologies, we will in the coming years identify genes that confer risk of specific mental illnesses.

This information will be of the highest importance for several reasons. First, genes are the blueprints of cells. The products of genes, proteins, work together in pathways or in building cellular structures, so that finding variants within genes will suggest pathways that can be targets of opportunity for the development of new therapeutic interventions. Genes will also be important clues to what goes wrong in the brain when a disease occurs. For example, once we know that a certain gene is involved in risk of a particular mental illness such as schizophrenia or autism, we can ask at what time during the development of the brain that particular gene is active and in which cells and circuits the gene is expressed. This will give us clues to critical times for intervention in a disease process and information about what it is that goes wrong. Finally, genes will provide tools for those scientists who are searching for environmental risk factors. Information from genetics will tell us at what age environmental cofactors in risk must be active, and genes will help us identify homogeneous populations for studies of treatment and of prevention.

Heritability refers to how much genetics contributes to the variation of a disease or trait in a population at a given point in time (Plomin et al.,

1997). Once a disorder is established as running in families, the next step is to determine its heritability (see below), then its mode of transmission, and, lastly, its location through genetic mapping (Lombroso et al., 1994).

One powerful method for estimating heritability is through twin studies.[8] Twin studies often compare the frequency with which identical versus fraternal twins display a disorder. Since identical twins are from the same fertilized egg, they share the exact genetic inheritance. Fraternal twins are from separate eggs and thereby share only 50 percent of their genetic inheritance. If a disorder is heritable, identical twins should have a higher rate of concordance—the expression of the trait by *both* members of a twin pair—than fraternal twins. Such studies, however, do not furnish information about *which* or *how many* genes are involved. They just can be used to estimate heritability. For example, the heritability of bipolar disorder, according to the most rigorous twin study, is about 59 percent, although other estimates vary (NIMH, 1998). The heritability of schizophrenia is estimated, on the basis of twin studies, at a somewhat higher level (NIMH, 1998).

Even with a high level of heritability, however, it is essential to point out that environmental factors (e.g., psychosocial environment, nutrition, health care access) can play a significant role in the severity and course of a disorder.

Another point is that environmental factors may even protect against the disorder developing in the first place. Even with the relatively high heritability of schizophrenia, the median concordance rate among identical twins is 46 percent[9] (NIMH, 1998), meaning that in over *half* of the cases, the second twin does not manifest schizophrenia even though he or she has the same genes as the affected twin. This implies that environmental factors exert a significant role in the onset of schizophrenia.

Infectious Influences

It has been known since the early part of the 20th century that infectious agents can penetrate into the brain where they can cause mental disorders. A highly common mental disorder of unknown etiology at the turn of the century, termed "general paresis," turned out to be a late manifestation of syphilis. The sexually transmitted infectious agent—*Treponema pallidum*—first caused symptoms in reproductive organs and then, sometimes years later, migrated to the brain where it led to neurosyphilis. Neurosyphilis was manifest by neurological deterioration (including psychosis), paralysis, and later death. With the wide availability of penicillin after World War II, neurosyphilis was virtually eliminated (Barondes, 1993).

Neurosyphilis may be thought of as a disease of the past (at least in the developed world), but dementia associated with infection by the human immunodeficiency virus (HIV) is certainly not. HIV-associated dementia continues to encumber HIV-infected individuals worldwide. HIV infection penetrates into the brain, producing a range of progressive cognitive and behavioral impairments. Early symptoms include impaired memory and concentration, psychomotor slowing, and apathy. Later symptoms, usually appearing years after infection, include global impairments marked by mutism, incontinence, and paraplegia (Navia et al., 1986). The prevalence of HIV-associated dementia varies, with estimates ranging from 15 percent to 44 percent of patients with HIV infection (Grant et al., 1987; McArthur et al., 1993). The high end of this estimate includes patients with subtle neuropsychological abnormalities. What is remarkable about HIV-associated dementia is that it appears to be caused not by *direct* infection of neurons, but by infection of immune cells known as

[8] Establishing that a disorder runs in families could suggest environmental and/or genetic influences because families share genes and environment. Comparing identical versus fraternal twins assumes that their shared environments are about equal, thereby providing insight about genetic influences. Such comparisons are further enhanced by studies of twins (identical vs. fraternal) separated at birth and adopted by different families.

[9] The median concordance rate for identical twins is only 14 percent (NIMH, 1998).

macrophages that enter the brain from the blood. The macrophages *indirectly* cause dysfunction and death in nearby neurons by releasing soluble toxins (Epstein & Gendelman, 1993).

Besides HIV-associated dementia and neurosyphilis, other mental disorders are caused by infectious agents. They include herpes simplex encephalitis, measles encephalomyelitis, rabies encephalitis, chronic meningitis, and subacute sclerosing panencephalitis (Kaplan & Sadock, 1998). More recently, research has uncovered an infectious etiology to one form of obsessive-compulsive disorder, as explained below.

PANDAS

In the late 1980s, it was discovered that some children with obsessive-compulsive disorder (OCD) experienced a sudden onset of symptoms soon after a streptococcal pharyngitis (Garvey et al., 1998). The symptoms were classic for OCD—concerns about contamination, spitting compulsions, and extremely excessive hoarding—but the abrupt onset was unusual. Further study of these children led to the identification of a new classification of OCD called PANDAS. This acronym stands for pediatric autoimmune neuropsychiatric disorders associated with streptococcal infection. PANDAS are distinct from classic cases of OCD because of their episodic clinical course marked by sudden symptom exacerbation linked to streptococcal infection, among other unique features. The exacerbation of symptoms is correlated with a rise in levels of antibodies that the child produces to fight the strep infection. Consequently, researchers proposed that PANDAS are caused by antibodies against the strep infection that also manage to attack the basal ganglia region of the child's brain (Garvey et al., 1998). In other words, the strep infection triggers the child's immune system to develop antibodies, which, in turn, may attack the child's brain, leading to obsessive and compulsive behaviors. Under this proposal, the strep infection does not directly induce the condition; rather, it may do so *indirectly* by triggering antibody formation. How the antibodies are so damaging to a discrete region of the child's brain and how this attack ignites OCD-like symptoms are two of the fundamental questions guiding research.

Psychosocial Influences on Mental Health and Mental Illness

This chapter thus far has highlighted some of the psychosocial influences on mental health and mental illness. Stressful life events, affect (mood and level of arousal), personality, and gender are prominent psychological influences. Social influences include parents, socioeconomic status, racial, cultural, and religious background, and interpersonal relationships. These psychosocial influences, taken individually or together, are integrated into many chapters of this report in discussions of epidemiology, etiology, risk factors, barriers to treatment, and facilitators to recovery.

Since these psychosocial influences are familiar to the general reader, detailed description of each is beyond the scope of this section (with the exception of cultural influences, which are discussed in the Overview of Cultural Diversity and Mental Health Services section). Instead, this section summarizes the sweeping theories of individual behavior and personality that inspired a vast body of psychosocial research: psychodynamic theories, behaviorism, and social learning theories. The therapeutic strategies that arose from these theories, and modifications necessary to make them relevant to the changing demography of the U.S. population, are discussed in a later section, Overview of Treatment.

Psychodynamic Theories

Psychodynamic theories of personality assert that behavior is the product of underlying conflicts over which people often have scant awareness. Sigmund Freud (1856–1939) was the towering proponent of psychoanalytic theory, the first of the 20th-century psychodynamic theories. Many of Freud's

followers pioneered their own psychodynamic theories, but this section covers only psychoanalytic theory. A brief discussion of Freud's work contributes to an historical perspective of mental health theory and treatment approaches.

Freud's theory of psychoanalysis holds two major assumptions: (1) that much of mental life is unconscious (i.e., outside awareness), and (2) that past experiences, especially in early childhood, shape how a person feels and behaves throughout life (Brenner, 1978).

Freud's structural model of personality divides the personality into three parts—the id, the ego, and the superego. The id is the unconscious part that is the cauldron of raw drives, such as for sex or aggression. The ego, which has conscious and unconscious elements, is the rational and reasonable part of personality. Its role is to maintain contact with the outside world in order to help keep the individual in touch with society. As such, the ego mediates between the conflicting tendencies of the id and the superego. The latter is a person's conscience that develops early in life and is learned from parents, teachers, and others. Like the ego, the superego has conscious and unconscious elements (Brenner, 1978).

When all three parts of the personality are in dynamic equilibrium, the individual is thought to be mentally healthy. However, according to psychoanalytic theory, if the ego is unable to mediate between the id and the superego, an imbalance would occur in the form of psychological distress and symptoms of mental disorders. Psychoanalytic theory views symptoms as important only in terms of expression of underlying conflicts between the parts of personality. The theory holds that the conflicts must be understood by the individual with the aid of the psychoanalyst who would help the person unearth the secrets of the unconscious. This was the basis for psychoanalysis as a form of treatment, as explained later in this chapter.

Behaviorism and Social Learning Theory

Behaviorism (also called learning theory) posits that personality is the sum of an individual's observable responses to the outside world (Feldman, 1997). As charted by J. B. Watson and B. F. Skinner in the early part of the 20th century, behaviorism stands at loggerheads with psychodynamic theories, which strive to understand underlying conflicts. Behaviorism rejects the existence of underlying conflicts and an unconscious. Rather, it focuses on observable, overt behaviors that are learned from the environment (Kazdin, 1996, 1997). Its application to treatment of mental problems, which is discussed later, is known as behavior modification.

Learning is seen as behavior change molded by experience. Learning is accomplished largely through either classical or operant conditioning. Classical conditioning is grounded in the research of Ivan Pavlov, a Russian physiologist. It explains why some people react to formerly *neutral* stimuli in their environment, stimuli that previously would not have elicited a reaction. Pavlov's dogs, for example, learned to salivate merely at the sound of the bell, without any food in sight. Originally, the sound of the bell would not have elicited salvation. But by repeatedly pairing the sight of the food (which elicits salvation on its own) with the sound of the bell, Pavlov taught the dogs to salivate just to the sound of the bell by itself.

Operant conditioning, a process described and coined by B. F. Skinner, is a form of learning in which a voluntary response is strengthened or attenuated, depending on its association with positive or negative consequences (Feldman, 1997). The strengthening of responses occurs by positive reinforcement, such as food, pleasurable activities, and attention from others. The attenuation or discontinuation of responses occurs by negative reinforcement in the form of removal of a pleasurable stimulus. Thus, human behavior is shaped in a trial and error way through positive and negative reinforcement, without any reference to inner conflicts or perceptions. What goes on inside

the individual is irrelevant, for humans are equated with "black boxes." Mental disorders represented maladaptive behaviors that were learned. They could be unlearned through behavior modification (behavior therapy) (Kazdin, 1996; 1997).

The movement beyond behaviorism was spearheaded by Albert Bandura (1969, 1977), the originator of social learning theory (also known as social cognitive theory). Social learning theory has its roots in behaviorism, but it departs in a significant way. While acknowledging classical and operant conditioning, social learning theory places far greater emphasis on a different type of learning, particularly observational learning. Observational learning occurs through selectively observing the behavior of another person, a model. When the behavior of the model is rewarded, children are more likely to imitate the behavior. For example, a child who observes another child receiving candy for a particular behavior is more likely to carry out similar behaviors. Social learning theory asserts that people's cognitions—their views, perceptions, and expectations toward their environment—affect what they learn. Rather than being passively conditioned by the environment, as behaviorism proposed, humans take a more active role in deciding what to learn as a result of cognitive processing. Social learning theory gave rise to cognitive-behavioral therapy, a mode of treatment described later in this chapter and throughout this report.

The Integrative Science of Mental Illness and Health

Progress in understanding depression and schizophrenia offers exciting examples of how findings from different disciplines of the mental health field have many common threads (Andreasen, 1997). Despite the differences in terminology and methodology, the results from different disciplines have converged to paint a vivid picture of the nature of the fundamental defects and the regions of the brain that underlie these defects. Even in the case of depression and schizophrenia, there is much to be uncovered about etiology, yet the mental health field is seen as poised "to use the power of multiple disciplines." The disciplines are urged to link together the study of the mind and the brain in the search for understanding mental health and mental illness (Andreasen, 1997).

This linkage already has been cemented between cognitive psychology, behavioral neurology, computer science, and neuroscience. These disciplines have knit together the field of "cognitive neuroscience" (Kosslyn & Shin, 1992). This new and joint discipline has carved out its own professional society, journals (Waldrop, 1993), and textbooks (Gazzaniga et al., 1998). There is movement toward integration of other disciplines within the field. To promote linkages between psychiatry and the neurosciences, neuroscientist Eric R. Kandel has furnished a novel approach. His essay, "A New Intellectual Framework for Psychiatry," supplies a set of biological principles to forge a rapprochement—conceptual as well as practical—between the two disciplines (Kandel, 1998). Integrated approaches are seen as vital to tackle the monumental complexity of mental function.

Overview of Development, Temperament, and Risk Factors

How we come to be the way we are is through the process of development. Generally defined as the lifelong process of growth, maturation, and change, development is the product of the elaborate interplay of biological, psychological, and social influences. By studying development, researchers hope to uncover the origins of both mental health and mental illness.

This section elaborates and extends concepts introduced above regarding the fundamental workings of the brain at different developmental stages. It then proceeds to explain several seminal theories of development pioneered by Jean Piaget, Erik Erikson, and John Bowlby. Their theories cover cognitive development, personality development, and social development, respectively,

although there is some overlap. Their major works, published in the 1950s and 1960s, were pivotal for the psychological and social sciences, galvanizing a huge body of theoretical and empirical research. However, with the advancements of science and the diversity of the population, these models may not apply to all groups without some adaptation for cultural context. The section concludes with a reminder that the brain is the "great synthesizer" of the many biological, psychological, and sociocultural phenomena that make us who we are.

Physical Development

Physical development of the nervous system provides the architecture for mental function (cognition, mood, and intentional behavior). As can be inferred from the discussion of brain complexity in the introductory section, nervous system development is arguably one of the most monumentally complicated developmental achievements. One hundred billion neurons must form elaborate and precise arrays of interconnections. Neurons begin the developmental process as undifferentiated cells, cells so seemingly anonymous that they are almost indistinguishable from other cells in an embryo. On the basis of genetic and epigenetic[10] influences, the cells must first specialize, or differentiate, into neurons, migrate to their final position, and then send their growing axons (the branch of a neuron that transmits impulses) to project over long distances in order to form synapses with distant target cells (Kandel et al., 1995).

Most neurobiologists are astounded at the level of precision that neurons achieve in their interconnections. The process of nervous system development has been studied at increasingly complex levels—molecular, cellular, tissue, and behavioral levels. Yet, while researchers have charted many of the behavioral milestones of development because they are so amenable to observation and analysis, far less is known about molecular, cellular, and tissue interactions that underlie them.

Four overarching findings or organizing principles have been gleaned from decades of neuroscience research. The first finding is that the formation of connections between neurons and their target cells depends on axons growing along anatomical pathways that are studded with signaling molecules, much like landing lights illuminate the runway for a descending plane. The second finding is that an axon's reaching the vicinity of, and locating, its correct target cell depends on diffusable chemical signals being transmitted from the target cell. The third finding is that if an axon does not reach its correct target, it is likely to die. This phenomenon, known as cell death, or apoptosis, is so common that it affects up to half of all developing neurons. The brain overproduces the number of cells it needs, from which it pares down to only the correct connections (Kandel et al., 1995). Finally, neuron *activity* is essential to strengthening the connections that are formed. In other words, stimulation from the environment—which is translated into neuron activity—is vital for the forging of normal neural development (Shatz, 1993; Kandel, 1995). This is a fundamental principle that is revisited later in this section. This principle helps to explain why, for example, babies who are deprived of a stimulating environment during their first year sometimes suffer irreparable developmental effects.

Behavior at birth consists of a repertoire of simple reflexes, that is, inborn neurological reactions that are involuntary in nature. Two examples are the sucking reflex and the rooting reflex,[11] both of which are designed to ensure food intake. Over time, the infant displays an expanded repertoire of fine and gross motor skills (e.g., crawling, walking) that begin to unfold in the first few months and year of life. These include the

[10] Epigenetic influences are those that arise from outside the genes and lead to emergent, as opposed to predetermined, properties.

[11] Newborns turn their head towards things—typically the breast—that touch their cheek.

cherished ability to smile, which helps to solidify a social bond with parents and caregivers. What begins as a child's biological survival need for food—evidenced by such behaviors as rooting and sucking—can turn into a social, interpersonal experience with the caregiver, as in the smile of an infant at the sight of a nurturing parent. These burgeoning motor capabilities are the forerunners of more complex behavioral and mental functions, but the actual relationships between early and later abilities, and their molecular and cellular basis, are understood only in the most rudimentary terms.

Theories of Psychological Development

Theories of human development are grounded in the developmental perspective. The developmental perspective takes into account the biological, social, and psychological environment; their interaction; and their combined effect upon the individual throughout the life span. Developmentalist L. Breger (1974) proposes that the developmental perspective incorporates three key precepts:

- Behavioral maturation proceeds from the simple to the complex;
- Future behaviors, whether temporally near or distant, are a product of their antecedents (prior responses to the developmental environment); and
- The human response to a particular event or experience often depends on the developmental stage at which the experience occurs.

Each of these precepts is thought to apply to neurobiological development, as well as behavioral/psychosocial development. Moreover, each has implications for whether an individual experiences either healthful or unhealthful development that may lead to a mental disorder.

The three precepts are at the heart of each of the three major mainstream theories of developmental psychology that have guided research and increased our understanding of both normal and abnormal human development across the life span. The following paragraphs offer brief sketches of the developmental theories of Jean Piaget, Erik Erikson, and John Bowlby; again, these sketches are provided to afford the reader an historical perspective of research on psychological development.

Piaget: Cognitive Developmental Theory

Jean Piaget formulated one of the most influential theories of cognitive development (Inhelder & Piaget, 1958). Its focus was on cognitive (intellectual) development, that is, the processes by which children come to know and understand the world. Other aspects of human growth, both physical and emotional, are beyond the scope of his theory. Piaget posited that each step of cognitive development proceeds from the previous step in a fixed pattern, beginning at birth and ending in the teen years.

Piaget had a seminal influence on the discipline of cognitive psychology. Although empirical research has called into question some of the specifics of his theories, the broad outlines remain widely accepted.

Erik Erikson: Psychoanalytic Developmental Theory

The psychoanalytic theory of development is best exemplified in the work of Erik Erikson, a psychoanalyst who expanded upon Freud's original theories of psychosexual development. One of Erikson's pioneering contributions was that development unfolded throughout the life span, a view that has become widely embraced.

Freud postulated that development proceeded through a series of stages in which children seek pleasure or gratification from a particular body part (i.e., the oral, anal, and phallic stage). In contrast, Erikson's theories of child development focus on the interrelationship between a developing child's internal psychosexual development and his or her more external emotional development, emphasizing the interpersonal relationships that arise between the child and parents (Erikson, 1950).

Erikson conceived of the life course, from birth to old age, as a series of eight epigenetic stages that, as other developmental theories, proceed in a stepwise fashion, the next dependent upon how well the previous has been mastered: trust versus mistrust; autonomy versus shame and doubt; initiative versus guilt; industry versus inferiority; identity versus role diffusion; intimacy versus isolation; generativity versus stagnation; ego integrity versus despair.

Erikson portrayed each stage as a crisis or conflict that needed resolution, either at the time or at a subsequent stage. Each successive stage presents its own challenges but, at the same time, offers the opportunity for correction of unresolved challenges of previous stages. At each stage the tension was between the psychosocial and psychosexual—the outward-looking versus inward-looking perspectives. Psychopathology, in the form of a mental disorder, would arise if a stage was ultimately not mastered successfully.

Over the years, Erikson's theory has had great heuristic value to guide theorists and practitioners in organizing their approach to mental health and mental illness. However, his theory does not readily lend itself to empirical scrutiny. His theory also has been criticized as reflecting the concerns of male European culture (where Erikson was born and trained before moving to the United States) rather than those of women and other cultures. The need for cultural sensitivity and competence is discussed later in this chapter.

John Bowlby: Attachment Theory of Development

Fifty years ago, a new conceptualization of the psychoanalytic approach to development came into the lexicon of human development theory. John Bowlby's reinterpretation of Freudian development is grounded in both Darwinian evolutionary theory and animal ethology. The previous work of Konrad Lorenz and others, who explored the relationship between other animals and their caregivers, determined that the bonds of infant care and the attachment of young to their caregivers are seminal in the drive for survival. Similarly, Bowlby theorized that for humans, attachment to a caregiver had a biological basis in the need for survival (Bowlby, 1951). Moreover, he suggested that this attachment drive exists alongside the drive for nutrition and the sex drive, yet distinct and separate from them. Attachment is seen as the anchor that enables the developing child to explore the world.

With the comfort and security of a stable and routine attachment to the mother—or other primary caregiver—a child is able to organize other elements of development in a coherent way. In contrast, instability in the caregiving relationship—whether physical distance, erratic patterns of parental behavior, or even physical or emotional abuse—may interfere with the sense of trust and security, potentially giving rise to anxiety and psychological problems later in childhood or even decades later in life.

Nature and Nurture: The Ultimate Synthesis

For over a century, an intense debate among developmentalists and other scientists has pitted nature (genetic inheritance) against nurture (environment) as the engine of human development and behavior. Francis Galton, a 19th-century geneticist and cousin of Charles Darwin, declared that "there is no escape from the conclusion that nature prevails enormously over nurture" (cited in Plomin, 1996). As the debate raged, either nature or nurture gained ascendancy. During the 1940s and 1950s, for example, behaviorism held sway over American psychology with its argument that nurture was preeminent.

The pendulum now is coming to rest with the recognition that behavior is the product of both nature and nurture (Plomin, 1996). Each contributes to the development of mental health and mental illness. Nature and nurture are not necessarily independent forces but can interact with

one another: nature can influence nurture, and nurture can influence nature (Plomin, 1996).

Studies comparing identical and fraternal twins have shed light on the contributions of nature and nurture. These studies show that for many behavioral traits, as well as mental disorders, there is a noticeable heritable component (see earlier discussion of heritability). Yet even with the most highly heritable traits or conditions, identical twins who share the same genetic endowment display marked differences. Identical twins, for example, are concordant for schizophrenia in 46 percent of pairs (NIMH, 1998), meaning that more than 50 percent of pairs are *not* concordant. Something yet unknown about the environment protects against the development of schizophrenia in genetically identical individuals (Plomin, 1996).

How do nature and nurture interact? This question cannot be directly answered by twin studies. Animal models have proven to be fertile ground for study of the mechanisms—at the molecular and cellular level—by which nature and nurture interact. As reviewed earlier, research in different animal models has established that the environment can alter the *structure* and *function* of the central nervous system (Baily & Kandel, 1993). This holds true not only during early development, but also into adulthood. Nurture influences nature, right down to detectable changes in the brain.

During development of the nervous system, each neuron forms myriad intricate synaptic connections with other neurons, the outcome of the interaction of genes and the environment described above. In this case, the environment is a very general term—it denotes the local extracellular environment surrounding the growing neuron, as well as what we traditionally think of as the environment (sensory environment, psychosocial environment, diet, etc.). When a neuron forms a synapse with its target cell, the pattern of activity, usually furnished by external environmental stimulation, strengthens or weakens the developing synapse. Only strengthened synaptic connections survive early development to form enduring connections, while weakened synaptic connections are eliminated (Shatz, 1993; Kandel et al., 1995). For example, kittens deprived of visual experience early in life sustain permanent disruption to synapses in parts of their visual cortex (Hubel & Wiesel, 1970).

Later in the course of development, established patterns of connections still can be altered by the environment—through learning. Studies in a variety of animal models have found that certain forms of learning lead to changes in the structure and function of neurons. With long-term memory—the long-term storage of learned information—these changes take the form of an enhanced number of synaptic connections and increased gene expression (Kandel et al., 1995). Increased gene expression appears to be for synthesis of new proteins needed for the structural changes occurring at the synapse (Bailey & Kandel, 1993).

Researchers continue to probe for changes in the brain associated with mental disorders. They have found, for instance, that repeated stress from the environment affects the hippocampus, an area of the brain located deep within the cerebral hemispheres. Research in animals has shown that repeated stress triggers atrophy of dendrites of certain types of neurons in a segment of the hippocampus (Sapolsky, 1996; McEwen, 1998). Similarly, imaging studies in humans suggest that stress-related disorders (e.g., post-traumatic stress disorder) induce possibly irreversible atrophy of the hippocampus (McEwen & Magarinos, 1997). Anxiety disorders also alter neuroendocrine systems (Sullivan et al., 1998). These are some of the tantalizing ways in which nurture influences nature.

The mental health field is far from a complete understanding of the biological, psychological, and sociocultural bases of development, but developpment clearly involves interplay among these influences. Understanding the process of development requires knowledge, ranging from the most fundamental level—that of gene expression and

interactions between molecules and cells—all the way up to the highest levels of cognition, memory, emotion, and language. The challenge requires integration of concepts from many different disciplines. A fuller understanding of development is not only important in its own right, but it is expected to pave the way for our ultimate understanding of mental health and mental illness and how different factors shape their expression at different stages of the life span.

Overview of Prevention

The field of public health has long recognized the imperative of prevention to contain a major health problem (IOM, 1988). The principles of prevention were first applied to infectious diseases in the form of mass vaccination, water safety, and other forms of public hygiene. As successes amassed, prevention came to be applied to other areas of health, including chronic diseases (IOM, 1994a). A landmark report published by the Institute of Medicine in 1994 extended the concept of prevention to mental disorders (IOM, 1994a). *Reducing Risks for Mental Disorders* evaluated the body of research on the prevention of mental disorders, offered new definitions of prevention, and provided recommendations on Federal policies and programs, among other goals.

Preventing an illness from occurring is inherently better than having to treat the illness after its onset. In many areas of health, increased understanding of etiology and the role of risk and protective factors in the onset of health problems has propelled prevention. In the mental health field, however, progress has been slow because of two fundamental and interrelated problems: for most major mental disorders, there is insufficient understanding about etiology and/or there is an inability to alter the *known* etiology of a particular disorder. While these have stymied the development of prevention interventions, some successful strategies have emerged in the absence of a full understanding of etiology.

Rigorous scientific trials have documented successful prevention programs in such areas as dysthymia and major depressive disorder (Munoz et al., 1987; Clarke et al., 1995), conduct problems (Berrento-Clement et al., 1984), and risky behaviors leading to HIV infection (Kalichman et al., in press) and low birthweight babies (Olds et al., 1986). Much progress also has been made to prevent the occurrence of lead poisoning, which, if unchecked, can lead to serious and persistent cognitive deficits in children (Centers for Disease Control and Prevention, 1991; Pirkle et al., 1994). Lastly, historical milestones in prevention of mental illness led to the successful eradication of neurosyphilis, pellagra, and measles encephalomyelitis (measles invasion of the brain) in the developed world.

Definitions of Prevention

The term "prevention" has different meanings to different people. It also has different meanings to different fields of health. The classic definitions used in public health distinguish between primary prevention, secondary prevention, and tertiary prevention (Commission on Chronic Illness, 1957). Primary prevention is the prevention of a disease before it occurs; secondary prevention is the prevention of recurrences or exacerbations of a disease that already has been diagnosed; and tertiary prevention is the reduction in the amount of disability caused by a disease to achieve the highest level of function.

The Institute of Medicine report on prevention identified problems in applying these definitions to the mental health field (IOM, 1994a). The problems stemmed mostly from the difficulty of diagnosing mental disorders and from shifts in the definitions of mental disorders over time (see Diagnosis of Mental Illness). Consequently, the Institute of Medicine redefined prevention for the mental health field in terms of three core activities: prevention, treatment, and maintenance (IOM, 1994a). Prevention, according to the IOM report, is similar to the classic concept of primary prevention

from public health; it refers to interventions to ward off the initial onset of a mental disorder. Treatment refers to the identification of individuals with mental disorders and the standard treatment for those disorders, which includes interventions to reduce the likelihood of future co-occurring disorders. And maintenance refers to interventions that are oriented to reduce relapse and recurrence and to provide rehabilitation. (Maintenance incorporates what the public health field traditionally defines as some forms of secondary and all forms of tertiary prevention.)

The Institute of Medicine's new definitions of prevention have been very important in conceptualizing the nature of prevention activities for mental disorders; however, the terms have not yet been universally adopted by mental health researchers. As a result, this report strives to use the terms employed by the researchers themselves. To avoid confusion, the report furnishes the relevant definition along with study descriptions.

When the term "prevention" is used in this report *without a qualifying term*, it refers to the prevention of the initial onset of a mental disorder or emotional or behavioral problem, including prevention of comorbidity. First onset corresponds to the initial point in time when an individual's mental health problems meet the full criteria for a diagnosis of a mental disorder.

Risk Factors and Protective Factors

The concepts of risk and protective factors, risk reduction, and enhancement of protective factors (also sometimes referred to as fostering resilience) are central to most empirically based prevention programs. Risk factors are those characteristics, variables, or hazards that, if present for a given individual, make it more likely that this individual, rather than someone selected at random from the general population, will develop a disorder (Garmezy, 1983; Werner & Smith, 1992; IOM, 1994a). To qualify as a risk factor the variable must antedate the onset of the disorder. Yet risk factors are not static. They can change in relation to a developmental phase or a new stressor in one's life, and they can reside within the individual, family, community, or institutions. Some risks such as gender and family history are fixed; that is, they are not malleable to change. Other risk factors such as lack of social support, inability to read, and exposure to bullying can be altered by strategic and potent interventions (Coie & Krehbiel, 1984; Silverman, 1988; Olweus, 1991; Kellam & Rebok, 1992). Current research is focusing on the interplay between biological risk factors and psychosocial risk factors and how they can be modified. As explained earlier, even with a highly heritable condition such as schizophrenia, concordance studies show that in over half of identical twins, the second twin does not have schizophrenia. This suggests the possibility of modifying the environment to eventually prevent the biological risk factor (i.e., the unidentified genes that contribute to schizophrenia) from being expressed.

Prevention not only focuses on the risks associated with a particular illness or problem but also on protective factors. Protective factors improve a person's response to some environmental hazard resulting in an adaptive outcome (Rutter, 1979). Such factors, which can reside with the individual or within the family or community, do not necessarily foster normal development in the absence of risk factors, but they may make an appreciable difference on the influence exerted by risk factors (IOM, 1994a). There is much to be learned in the mental health field about the role of protective factors across the life span and within families as well as individuals. The potential for altering these factors in intervention studies is enormous. The construct of "resilience" is related to the concept of protective factors, but it focuses more on the ability of a single individual to withstand chronic stress or recover from traumatic life events. There are many different perceptions of what constitutes resilience or "competence," another related term. Despite the increasing popularity of these ideas, "virtually no intervention

studies have been conducted that test the outcomes of resilience variables" (Grover, 1998).

Preventive researchers use risk status to identify populations for intervention, and then they target risk factors that are thought to be causal and malleable and target protective factors that are to be enhanced. If the interventions are successful, the amount of risk decreases, protective factors increase, and the likelihood of onset of the potential problem also decreases. The risks for onset of a disorder are likely to be somewhat different from the risks involved in relapse of a previously diagnosed condition. This is an important distinction because at-risk terminology is used throughout the mental health intervention spectrum. The optimal treatment protocol for an individual with a serious mental condition aims to reduce the length of time the disorder exists, halt a progression of severity, and halt the recurrence of the original disorder, or if not possible, to increase the length of time between episodes (IOM, 1994a). To do this requires an assessment of the individual's specific risks for recurrence.

Many mental health problems, especially in childhood, share some of the same risk factors for initial onset, so targeting those factors can result in positive outcomes in multiple areas. Risk factors that are common to many disorders include individual factors such as neurophysiological deficits, difficult temperament, chronic physical illness, and below-average intelligence; family factors such as severe marital discord, social disadvantage, overcrowding or large family size, paternal criminality, maternal mental disorder, and admission into foster care; and community factors such as living in an area with a high rate of disorganization and inadequate schools (IOM, 1994a). Also, some individual risk factors can lead to a state of vulnerability in which other risk factors may have more effect. For example, low birthweight is a general risk factor for multiple physical and mental outcomes; however, when it is combined with a high-risk social environment, it more consistently has poorer outcomes (McGauhey et al., 1991). The accumulation of risk factors usually increases the likelihood of onset of disorder, but the presence of protective factors can attenuate this to varying degrees.

The concept of accumulation of risks in pathways that accentuate other risks has led prevention researchers to the concept of "breaking the chain at its weakest links" (Robins, 1970; IOM, 1994a). In other words, some of the risks, even though they contribute significantly to onset, may be less malleable than others to intervention. The preventive strategy is to change the risks that are most easily and quickly amenable to intervention. For example, it may be easier to prevent a child from being disruptive and isolated from peers by altering his or her classroom environment and increasing academic achievement than it is to change the home environment where there is severe marital discord and substance abuse.

Because mental health is so intrinsically related to all other aspects of health, it is imperative when providing preventive interventions to consider the interactions of risk and protective factors, etiological links across domains, and multiple outcomes. For example, chronic illness, unemployment, substance abuse, and being the victim of violence can be risk factors or mediating variables for the onset of mental health problems (Kaplan et al., 1987). Yet some of the same factors also can be related to the consequences of mental health problems (e.g., depression may lead to substance abuse, which in turn may lead to lung or liver cancer).

Overview of Treatment

Introduction to Range of Treatments

Mental disorders are treatable, contrary to what many think.[12] An armamentarium of efficacious treatments is available to ameliorate symptoms. In

[12] About 40 percent of those surveyed thought that they "didn't think anyone could help" as a reason for not seeking mental health treatment (Sussman et al., 1987).

fact, for most mental disorders, there is generally not just one but a *range* of treatments of proven efficacy. Most treatments fall under two general categories, psychosocial and pharmacological.[13] Moreover, the combination of the two—known as multimodal therapy—can sometimes be even more effective than each individually (see Chapter 3).

The evidence for treatment being more effective than placebo is overwhelming, as documented in the main chapters of this report (Chapters 3 through 5). The degree of effectiveness tends to vary, depending on the disorder and the target population (e.g., older adults with depression). What is optimal for one disorder and/or age group may not be optimal for another. Further, treatments generally need to be tailored to the client and to client preferences.

The inescapable point is that studies demonstrate conclusively that treatment is more effective than placebo. Placebo (an inactive form of treatment) in both pharmacological and psychotherapy studies has a powerful effect in its own right, as this section later explains. Placebo is more effective than no treatment. Therefore, to capitalize on the placebo response, people are encouraged to seek treatment, even if the treatment is not as optimal as that described in this report.

If treatment is so effective, then why are so few people receiving it? Studies reveal that less than one-third of adults with a diagnosable mental disorder, and even a smaller proportion of children, receive any mental health services in a given year. This section of the chapter strives to explain why by examining the types of barriers that prevent people from seeking help. But the chapter first covers some general points about psychological and pharmacological therapies. It also discusses why therapies that work so well in research settings do not work as well in practice.

[13] Other treatments are electroconvulsive therapy (Chapters 4 and 5) and some types of surgery.

Psychotherapy

Psychotherapy is a learning process in which mental health professionals seek to help individuals who have mental disorders and mental health problems. It is a process that is accomplished largely by the exchange of verbal communication, hence it often is referred to as "talk therapy." Many of the theories undergirding each orientation to psychotherapy were summarized earlier in this chapter.

Participants in psychotherapy can vary in age from the very young to the very old, and problems can vary from mental health problems to disabling and catastrophic mental disorders. Although people often are seen individually, psychotherapy also can be done with couples, families, and groups. In each case, participants present their problems and then work with the psychotherapist to develop a more effective means of understanding and handling their problems. This report focuses on individual psychotherapy and also mentions couples therapy and various forms of family interventions, particularly psycho-educational approaches. Although not discussed in the report, group psychotherapy is effective for selected individuals with some mood disorders, anxiety disorders, schizophrenia, personality disorders, and for mental health problems seen in somatic illness (Yalom, 1995; Kanas, in press).

Estimates of the number of orientations to psychotherapy vary from a very small number to well over 400. The larger estimate generally refers to all the variations of the three major orientations, that is, psychodynamic, behavioral, and humanistic. Each orientation falls under the more general conceptual category of either action or reflection.

Psychodynamic orientations are the oldest. They place a premium on self-understanding, with the implicit (or sometimes explicit) assumption that increased self-understanding will produce salutary changes in the participant. Behavioral orientations are geared toward action, with a clear attempt to mobilize the resources of the patient in the direction of change, whether or not there is any

understanding of the etiology of the problem. Humanistic orientations aim toward increased self-understanding, often in the direction of personal growth, but use treatment techniques that often are much more active than are likely to be employed by the psychodynamic clinician.

While the following paragraphs focus on psychodynamic, behavioral, and humanistic orientations, they also discuss interpersonal therapy and cognitive-behavioral therapy as outgrowths of psychodynamic and behavioral therapy, respectively. Psychodynamic, interpersonal, and cognitive-behavioral therapy are most commonly the focus of treatment research reported throughout this report.

Psychodynamic Therapy

The first major approach to psychotherapy was developed by Sigmund Freud and is called psychoanalysis (Horowitz, 1988). Since its origin more than a century ago, psychoanalysis has undergone many changes. Today, Freudian (or classical) psychoanalysis is still practiced, but other variations have been developed—ego psychology, object relations theory, interpersonal psychology, and self-psychology, each of which can be grouped under the general term "psychodynamic" (Horowitz, 1988). The psychodynamic therapies, even though they differ somewhat in theory and approach, all have some concepts in common. With each, the role of the past in shaping the present is emphasized, so it is important, in understanding behavior, to understand its origins and how people come to act and feel as they do. A second critical concept common to all psychodynamic approaches is the belief in the unconscious, so that there is much that influences our behavior of which we are not aware. This makes the process of understanding more difficult, as we often act for reasons that we cannot state, and these reasons often are linked to previous experiences. Thus, an important part of psychodynamic psychotherapy is to make the unconscious conscious or to help the patient understand the origin of actions that are troubling so that they can be corrected.

For some psychodynamic approaches, such as the classical Freudian approach, the focus is on the individual and the experiences the person had in the early years that give shape to current behavior, even beyond the awareness of the patient. For other, more contemporary approaches, such as *interpersonal therapy*, the focus is on the relationship between the person and others. First developed as a time-limited treatment for midlife depression, interpersonal therapy focuses on grief, role disputes, role transitions, and interpersonal deficits (Klerman et al., 1984). The goal of interpersonal therapy is to improve current interpersonal skills. The therapist takes an active role in teaching patients to evaluate their interactions with others and to become aware of self-isolation and interpersonal difficulties. The therapist also offers advice and helps the patient to make decisions.

Behavior Therapy

A second major approach to psychotherapy is known as behavior modification or behavior therapy (Kazdin, 1996, 1997). It focuses on current behavior rather than on early patterns of the patient. In its earlier form, behavior therapy dealt exclusively with what people did rather than what they thought or felt. The general principles of learning were applied to the learning of maladaptive as well as adaptive behaviors. Thus, if a person could be conditioned to act in a functional way, there was no reason why the same principles of conditioning could not be employed to help the person unlearn dysfunctional behavior and learn to replace it with more functional behavior. The role of the environment was very important for behavior therapists, because it provided the positive and negative reinforcements that sustained or eliminated various behaviors. Therefore, ways of shaping that environment to make it more responsive to the needs of the individual were important in behavior therapy.

More recently, there has been a significant addition to the interests and activities of behavior therapists. Although behavior continued to be important in relation to reinforcements, cognitions—what the person *thought* about, perceived, or interpreted what was transpiring—were also seen as important. This combined emphasis led to a therapeutic variant known as *cognitive-behavioral therapy*, an approach that incorporates cognition with behavior in understanding and altering the problems that patients present (Kazdin, 1996).

Cognitive-behavioral therapy draws on behaviorism as well as cognitive psychology, a field devoted to the scientific study of mental processes, such as perceiving, remembering, reasoning, decisionmaking, and problem solving. The use of cognition in cognitive-behavioral therapy varies from attending to the role of the environment in providing a model for behavior, to the close study of irrational beliefs, to the importance of individual thought processes in constructing a vision of the surrounding world. In each case, it is critical to study what the individual in therapy thinks and does and less important to understand the past events that led to that pattern of thinking and doing. Cognitive-behavioral therapy strives to alter faulty cognitions and replace them with thoughts and self-statements that promote adaptive behavior (Beck et al., 1979). For instance, cognitive-behavioral therapy tries to replace self-defeatist expectations ("I can't do anything right") with positive expectations ("I can do this right"). Cognitive-behavioral therapy has gained such ascendancy as a means of integrating cognitive and behavioral views of human functioning that the field is more frequently referred to as cognitive-behavioral therapy rather than behavior therapy (Kazdin, 1996).

Humanistic Therapy

The third wave of psychotherapy is referred to variously as humanistic (Rogers, 1961), existential (Yalom, 1980), experiential, or Gestalt therapy. It owes its origins as a treatment to the client-centered therapy that was originated by Carl Rogers, and the theory can be traced to philosophical roots beginning with the 19th century philosopher, Soren Kierkegaard. The central focus of humanistic therapy is the immediate experience of the client. The emphasis is on the present and the potential for future development rather than on the past, and on immediate feelings rather than on thoughts or behaviors. It is rooted in the everyday subjective experience of the person seeking assistance and is much less concerned with mental illness than it is with human growth.

One critical aspect of humanistic treatment is the relationship that is forged between the therapist, who in some ways serves as a guide in an exploration of self-discovery, and the client, who is seeking greater knowledge of the self and an expansion of inherent human potential. The focus on the self and the search for self-awareness is akin to psychodynamic psychotherapy, while the emphasis on the present is more similar to behavior therapy.

Although it is possible to describe distinctive orientations to psychotherapy, as has been done above, most psychotherapists describe themselves as eclectic in their practice, rather than as adherents to any single approach to treatment. As a result, there is a growing development referred to as "psychotherapy integration" (Wolfe & Goldfried, 1988). It strives to capture what is best about each of the individual approaches. Psychotherapy integration includes various attempts to look beyond the confines of any single orientation but rather to see what can be learned from other perspectives. It is characterized by an openness to various ways of integrating diverse theories and techniques. Psychotherapy also should be modified to be culturally sensitive to the needs of racial and ethnic minorities (Acosta et al., 1982; Sue et al., 1994; Lopez, in press).

The scientific evidence on efficacy presented in this report, however, is focused primarily on specific, standardized forms of psychotherapy.

Pharmacological Therapies

The past decade has seen an outpouring of new drugs introduced for the treatment of mental disorders (Nemeroff, 1998). New medications for the treatment of depression and schizophrenia are among the achievements stoked by research advances in both neuroscience and molecular biology. Through the process known as rational drug design, researchers have become increasingly sophisticated at designing drugs by manipulating their chemical structures. Their goal is to create more effective therapeutic agents, with fewer side effects, exquisitely targeted to correct the biochemical alterations that accompany mental disorders.

The process was not always so rational. Many of the older pharmacotherapies (drug treatments) that had been introduced by 1960 had been discovered largely by accident. Researchers studying drugs for completely different purposes serendipitously found them to be useful for treating mental disorders (Barondes, 1993). Thanks to their willingness to follow up on unexpected leads, drugs such as chlorpromazine (for psychosis), lithium (for bipolar disorder), and imipramine (for depression) became available. The advent of chlorpromazine in 1952 and other neuroleptic drugs was so revolutionary that it was one of the major historical forces behind the deinstitutionalization movement that is discussed later in this chapter.

The past generation of pharmacotherapies, once shown to be safe and effective, was introduced to the market generally before their mechanism of action was understood. Years of research after their introduction revealed how many of them work therapeutically. Knowledge about their actions has had two cardinal consequences: it helped probe the etiology of mental disorders, and it ushered in the next generation of pharmacotherapies that are more selective in their mechanism of action.

Mechanisms of Action

The mechanism of action refers to how a pharmacotherapy interacts with its target in the body to produce therapeutic effects. Pharmacotherapies that act in similar ways are grouped together into broad categories (e.g., stimulants, antidepressants). Within each category are several chemical classes. The individual pharmacotherapies within a chemical class share similar chemical structures. Table 2-9 presents several common categories and classes, along with their indication, that is, their clinical use.

Many pharmacotherapies for mental disorders have as their initial action the alteration—either increase or decrease—in the amount of a neurotransmitter. Neurotransmitter levels can be altered by pharmacotherapies in myriad ways: pharmacotherapies can mimic the action of the neurotransmitter in cell-to-cell signaling; they can block the action of the neurotransmitter; or they can alter its synthesis, breakdown (degradation), release, or reuptake, among other possibilities (Cooper et al., 1996).

Neurotransmitters generally are concentrated in separate brain regions and circuits. Within the cells that form a circuit, each neurotransmitter has its own biochemical pathway for synthesis, degradation, and reuptake, as well as its own specialized molecules known as receptors. At the time of neurotransmission, when a traveling signal reaches the tip (terminal) of the presynaptic cell, the neurotransmitter is released from the cell into the synaptic cleft. It migrates across the synaptic cleft in less than a millisecond and then binds to receptors situated on the membrane of the postsynaptic cell. The neurotransmitter's binding to the receptor alters the shape of the receptor in such a way that the neurotransmitter can either excite the postsynaptic cell, and thereby transmit the signal to this next cell, or inhibit the receptor, and thereby block signal transmission. The neurotransmitter's action is terminated either by enzymes that degrade it right there, in the synaptic cleft, or by transporter proteins that return unused neurotransmitter back to the presynaptic neuron for reuse, a "recycling" process known as reuptake. The widely prescribed class of antidepressants referred to as the selective

Table 2-9. Selected types of pharmacotherapies

Category and Class	Example(s) of Clinical Use
Antipsychotics (neuroleptics) Typical antipsychotics* Atypical antipsychotics**	Schizophrenia, psychosis
Antidepressants Selective serotonin reuptake inhibitors Tricyclic and heterocyclic antidepressants*** Monoamine oxidase inhibitors	Depression, anxiety
Stimulants	Attention-deficit/hyperactivity disorder
Antimanic Lithium Anticonvulsants Thyroid supplementation	Mania
Antianxiety (anxiolytics) Benzodiazepines Antidepressants β-Adrenergic-blocking drugs	Anxiety
Cholinesterase inhibitors	Alzheimer's disease

* Also known as first-generation antipsychotics, they include these chemical classes: phenothiazines (e.g., chlorpromazine), butyrophenones (e.g., haloperidol), and thioxanthenes (Dixon et al., 1995).

** Also known as second-generation antipsychotics, they include these chemical classes: dibenzoxazepine (e.g., clozapine), thienobenzodiazepine (e.g., olanzapine), and benzisoxazole (e.g., risperidone).

*** Include imipramine and amitriptyline.

Source: Perry et al., 1997

serotonin reuptake inhibitors primarily block the action of the transporter protein for serotonin, thus leaving more serotonin to remain at the synapse (Schloss & Williams, 1998). Depression is thought to be reflected in decreased serotonin transmission, so one rationale for this class of antidepressants is to boost the level of serotonin (see Chapter 4).

Although the effects of reuptake inhibitors on neurotransmitter concentrations in the synapse occur with the first dose, therapeutic benefit typically lags behind by days or weeks. This observation has spurred considerable recent research on chronic and "downstream" actions of psychotropics, particularly antidepressants. For example, in animal models the repeated administration of nearly all antidepressants is associated with a reduction in the number of postsynaptic β receptors, so-called down-regulation that parallels the time course of clinical effect in patients (Schatzberg & Nemeroff, 1998). Some of the secondary effects of reuptake inhibitors may be mediated by the activation of intraneuronal "second messenger" proteins which result from the stimulation of postsynaptic receptors (Schatzberg & Nemeroff, 1998).

Receptors for each transmitter come in numerous varieties. Not only are there several types of receptor for each neurotransmitter, but there may be many subtypes. For serotonin, for example, there are seven types of receptors, designated 5-HT_1–5-HT_7, and seven receptor subtypes, totaling 14 separate receptors (Schatzberg & Nemeroff, 1998). The pace at which receptors are identified has

become so dizzying that these figures are likely to be obsolete by the time this paragraph is read.

A pharmacotherapy typically interacts with a receptor in either one of two ways—as an agonist or as an antagonist.[14] When a pharmacotherapy acts as an agonist, it mimics the action of the natural neurotransmitter. When a pharmacotherapy acts as an antagonist, it inhibits, or blocks, the neurotransmitter's action, often by binding to the receptor and preventing the natural transmitter from binding there. An antagonist disrupts the action of the neurotransmitter.

The diversity of receptors presents vast opportunities for drug development. Through rational drug design, pharmacotherapies have become increasingly selective in their actions. Generally speaking, the more selective the pharmacotherapy's action, the more targeted it is to one receptor rather than another, the narrower its spectrum of action, and the fewer the side effects. Conversely, the broader the pharmacotherapy's action, the less targeted to a receptor type or subtype, the broader the effects, and the broader the side effects (Minneman, 1994). However, the interaction among neurotransmitter systems in the brain renders some of the apparent distinctions among medications more apparent than real. Thus, despite differential initial actions on neurotransmitters, both serotonin and norepinephrine reuptake blockers have similar biochemical effects after chronic dosing (Potter et al., 1985).

Complementary and Alternative Treatment

Recent interest in the health benefits of a plethora of natural products has engendered claims related to putative effects on mental health. These have ranged from reports of enhanced memory in people taking the herb, ginseng, to the use of the St. John's wort flowers as an antidepressant (see Chapter 4).

There are major challenges to evaluating the role of complementary and alternative treatments in maintaining mental health or treating mental disorders. In many cases, preparations are not standardized and consist of a variable mixture of substances, any of which may be the active ingredient(s). Purity, bioavailability, amount and timing of doses, and other factors that are standardized for traditional pharmaceutical agents prior to testing cannot be taken for granted with natural products. Current regulations in the United States classify most complementary and alternative treatments as "food supplements," which are not subject to premarketing approval of the Food and Drug Administration.

At present, no conclusions about the role, if any, of complementary and alternative treatments in mental health or illness can be accepted with certainty, as very few claims or studies meet acceptable scientific standards. With funding from government and private industry, controlled clinical trials are under way, including the use of St. John's wort (*Hypericum perforatum*) as a treatment for depression, and omega-3 fatty acids (fish oils) as a mood stabilizer in bipolar depression. In addition, it is important for clinicians and investigators to account for any herbs or natural products being taken by their patients or research subjects that might interact with traditional treatments.

Issues in Treatment

The foregoing section has furnished an overview of the types and nature of mental health treatment. The resounding message, which is echoed throughout this report, is that a range of efficacious treatments is available. The following material deals with four issues surrounding treatment—the placebo response, benefits and risks, the gap between how well treatments work in clinical trials versus in the real world, and the constellation of barriers that hinder people from seeking mental health treatment.

Placebo Response

Recognized since antiquity, the placebo effect refers to the powerful role of patients' attitudes and

[14] There are certainly exceptions to this general rule. Some pharmacotherapies work as partial agonists and partial antagonists simultaneously.

perceptions that help them improve and recover from health problems. Hippocrates established the therapeutic principle of physicians laying their hands in a reassuring manner to draw on the inner resources of the patient to fight disease. Technically speaking, the placebo effect refers to treatment responses in the placebo group, responses that cannot be explained on the basis of active treatment (Friedman et al., 1996a). A placebo is an inactive treatment, either in the form of an inert pill for studying a new drug treatment or an inactive procedure for studying a psychological therapy. The effects of active treatment are often compared with a control group that receives a pharmacological or psychological placebo.

It is not unusual for a placebo effect to be found in up to 50 percent of patients in any study of a medical treatment (Schatzberg & Nemeroff, 1998). For example, about 30 percent of patients typically respond to a placebo in a clinical trial of a new antidepressant (see Chapter 4). The rate is even higher for an antianxiety agent (an anxiolytic) (Schweizer & Rickels, 1997). The placebo effect is of such import that a placebo group or other control group[15] is mandated by the Food and Drug Administration in clinical trials of a new pharmacotherapy to establish its efficacy prior to marketing (Friedman et al., 1996a). If the pharmacotherapy is not statistically superior to the control, efficacy cannot be established. It is somewhat more difficult to fashion an analog of an inert pill in the testing of new and experimental psychological therapies. Psychological studies can employ a "psychological" placebo in the form of a treatment known to be ineffectual. Or they can employ a comparison group, which receives an alternative psychological therapy. Some treatment studies employ both a "psychological" placebo, as well as a comparison group.[16]

The basis of the placebo response is not fully known, but there are thought to be many possible reasons. These reasons, which relate to attributes of the disorder or the disease, the patient, and the treatment setting, include spontaneous remission, personality variables (e.g., social acquiescence), patient expectations, attitudes of and compassion by clinicians, and receiving treatment in a specialized setting (Schweizer & Rickels, 1997). In studies of postoperative pain, the placebo response is mediated by patients' production of endogenous pain-killing substances known as endorphins (Levine et al., 1978).

Benefits and Risks

Throughout this report, currently accepted treatments for mental disorders will be described. Except where otherwise indicated, the efficacy of these interventions has been documented in multiple controlled, clinical trials published in the peer-reviewed literature. In some cases, these have been supplemented by expert consensus reports or practice guidelines.

Most studies of efficacy of specific treatments for mental disorders have been highly structured clinical trials, performed on individuals with a single disorder, in good physical health. While necessary and important, these trials do not always generalize easily to the wider population, which includes many individuals whose mental disorder is accompanied by another mental or somatic disorder and/or alcohol or substance abuse, and who may be taking other medications. Moreover, children, adolescents, and the elderly are excluded from many clinical trials,[17] as are those in certain settings, such as nursing homes. Newer, more generalizable studies are being undertaken to

[15] When it is unethical to deprive patients of treatment, such as the case with AIDS, conventional treatment is given as the control.

[16] The criteria developed by a division of the American Psychological Association for establishing treatment efficacy call for the experimental treatment to be statistically superior to "pill or psychological placebo or to another treatment" (Chambless et al., 1998).

[17] In March 1998, the NIH issued a policy guideline stating that NIH-funded investigators will be expected to include children in clinical trials, which normally would involve adults only, when there is sound scientific rationale and in the absence of a strong justification to the contrary.

address these shortcomings of the scientific literature (Lebowitz & Rudorfer, 1998).

Pending the results of these newer studies, it is important, for clinical decisionmakers to review the current best evidence for the *efficacy* of treatments. People with mental disorders and their health providers should consider all possible options and carefully weigh the pros and cons of each, as well as the possibility of no treatment at all, before deciding upon a course of action. Such an informed consent process entails the calculation of a "benefit-to-risk ratio" for each available treatment option. Most medications or somatic treatments have side effects, for example, but a likelihood of significant clinical benefit often overrides side-effects in support of a treatment recommendation.

Gap Between Efficacy and Effectiveness

Mental health professionals have long observed that treatments work better in the clinical research trial setting as opposed to typical clinical practice settings. The diminished level of treatment effectiveness in real-world settings is so perceptible that it even has a name, the "efficacy-effectiveness gap." Efficacy is the term for what works in the clinical trial setting, and effectiveness is the term for what works in typical clinical practice settings. The efficacy-effectiveness gap applies to both pharmacological therapies and to psychotherapies (Munoz et al., 1994; Seligman, 1995). The gap is not unique to mental health, for it is found with somatic disorders too.

The magnitude of the gap can be surprisingly high. With schizophrenia medications, one review article found that, in clinical trials, the use of traditional antipsychotic medications for schizophrenia was associated with an average annual relapse rate of about 23 percent, whereas the same medications used in clinical practice carried a relapse rate of about 50 percent (Dixon et al., 1995). The magnitude of the gap found in this study may not apply to other medications and other disorders, much less to psychological therapies. Studies of real-world effectiveness are scarce. Yet some degree of gap is widely recognized. The question is, why?

Efficacy studies test whether treatment works under ideal circumstances. They typically exclude patients with other mental or somatic disorders. In the past, they typically have examined relatively homogeneous populations, usually white males. Furthermore, efficacy studies are carried out by highly trained specialists following strict protocols that require frequent patient monitoring. Finally, participation in efficacy studies is often free of charge to patients.

It is not surprising that the reasons commonly cited to explain the discrepancy between efficacy and effectiveness focus on the practicalities and constraints imposed by the real world. In real-world settings, patients often are more heterogeneous and ethnically diverse, are beset by comorbidity (more than one mental or somatic disorder),[18] are often less compliant, and are seen more often in general medical rather than specialty settings; providers are less inclined to adequately monitor and standardize treatment; and cost pressures exist on both patients and providers, depending on the nature of the financing of care (Dixon et al., 1995; Wells & Sturm, 1996). This constellation of real-world constraints appears to explain the gap.

Barriers to Seeking Help

Most people with mental disorders do not seek treatment, according to figures presented in the next section of this chapter and in Chapter 6. This general statement applies to adults and older adults and to parents and guardians who make treatment decisions for children with mental disorders. There is a multiplicity of reasons why people fail to seek treatment for mental disorders but few detailed studies. The barriers to treatment fall under several umbrella categories: demographic factors, patient attitudes toward a service system that often

[18] Having a second disorder increases the possibility of drug interactions, which may translate into reduced dosing. Comorbidity is discussed throughout this report.

neglects the special needs of racial and ethnic minorities, financial, and organizational.

Several demographic factors predispose people against seeking treatment. African Americans, Hispanics (Sussman et al., 1987; Gallo et al., 1995), and poor women (Miranda & Green, 1999) are less inclined than non-Hispanic whites—particularly females—to seek treatment. Common patient attitudes that deter people from seeking treatment are not having the time, fear of being hospitalized, thinking that they could handle it alone, thinking that no one could help, and stigma (being too embarrassed to discuss the problem) (Sussman et al., 1987). Above all, the cost of treatment is the most prevalent deterrent to seeking care, according to a large study of community residents (Sussman et al., 1987). Cost is a major determinant of seeking treatment even among people with health insurance because of inferior coverage of mental health as compared with health care in general. Finally, the organizational barriers include fragmentation of services and lack of availability of services (Horwitz, 1987). Members of racial and ethnic minority groups often perceive that services offered by the existing system do not or will not meet their needs, for example, by taking into account their cultural or linguistic practices. These particular barriers are discussed in greater depth with respect to minority groups (later in this chapter) and with respect to different ages (Chapters 3 to 5).

Demographic, attitudinal, financial, and organizational barriers operate at various points and to various degrees. Seeking treatment is conceived of as a complex process that begins with an individual or parent recognizing that thinking, mood, or behaviors are unusual and severe enough to require treatment; interpreting symptoms as a "medical" or mental health problem; deciding whether or not to seek help and from whom; receiving care; and, lastly, evaluating whether continuation of treatment is warranted (Sussman et al., 1987).

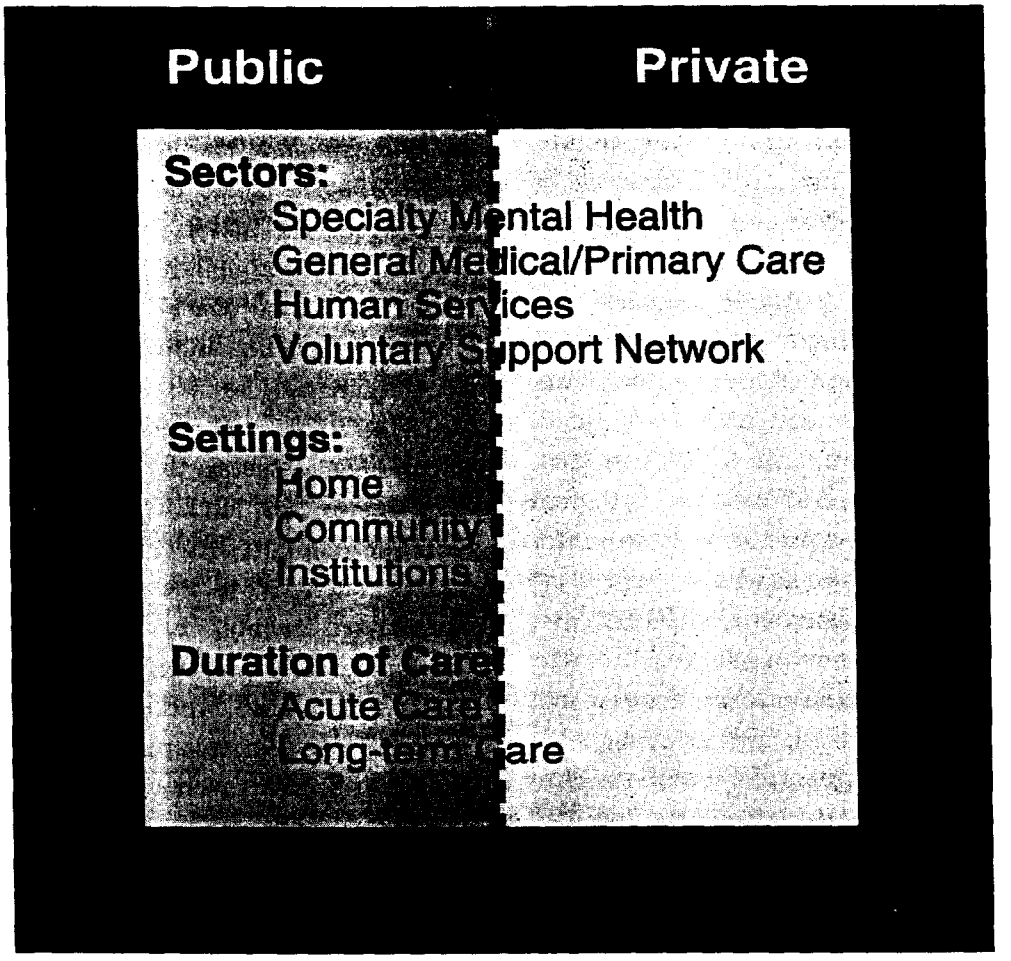
Overview of Mental Health Services

Over the past three centuries, the complex patchwork of mental health services in the United States has become so fragmented that it is referred to as the *de facto mental health system* (Regier et al., 1993b). Its shape has been determined by many heterogeneous factors rather than by a single guiding set of organizing principles. The de facto system has been characterized as having distinct sectors, financing, duration of care, and settings (see Figure 2-4).

The four sectors of the system are the specialty mental health sector, the general medical/primary care sector, the human services sector, and the voluntary support network sector. Specialty mental health services include services provided by specialized mental health professionals (e.g., psychologists, psychiatric nurses, psychiatrists, and psychiatric social workers) and the specialized offices, facilities, and agencies in which they work. Specialty services were designed expressly for the provision of mental health services. The general medical/primary care sector consists of health care professionals (e.g., family physicians, nurse practitioners, internists, pediatricians, etc.) and the settings (i.e., offices, clinics, and hospitals) in which they work. These settings were designed for the full range of health care services, including, but not specialized for, the delivery of mental health services. The human services sector consists of social welfare, criminal justice, educational, religious, and charitable services. The voluntary support network refers to self-help groups and organizations. These are groups devoted to education, communication, and support, all of which extend beyond formal treatment.

Financing of the de facto system refers to the payer of services. The system is often described as being divided into a public (i.e., government) and a private sector. The term "public sector" refers both to services directly operated by government agencies (e.g., state and county mental hospitals) and to services financed with government resources

Figure 2-4. The mental health service system



(e.g., Medicaid, a Federal-State program for financing health care services for people who are poor and disabled, and Medicare, a Federal health insurance program primarily for older Americans and people who retired early due to disability). Publicly financed services may be provided by private organizations. The term "private sector" refers both to services directly operated by private agencies and to services financed with private resources (e.g., employer-provided insurance).

The duration of care is divided between services for the treatment of acute conditions and those devoted to the long-term care of chronic (i.e., severe and persistent) conditions, such as schizophrenia, bipolar disorder, and Alzheimer's disease. The former, provided in psychiatric hospitals, psychiatric units in general hospitals, and in beds "scattered" in general hospital wards, includes brief treatment-oriented services. Long-term care includes residential care as well as some treatment services. Residential care is often referred to as "custodial," when supervised living predominates over active treatment.

The settings for care and treatment include institutional, community-based, and home-based. The former refers to facilities, particularly public mental hospitals and nursing homes, which usually are seen by patients and families as large, regimented, and impersonal. They often are removed from the community by distance and frequency of contact with friends and family. In contrast, community-based services are close to where patients or clients live. Services are typically provided by community agencies and organizations. Home-based services include informal supports provided in an individual's residence.

Chapter 6 examines the impact of recent changes in financing and organizing services on access and quality of care. Many of these issues also are addressed in Chapters 3 to 5, where they are discussed in the context of care and treatment at each stage of the life cycle. The following material provides general information on current patterns of use and focuses on the historical origins of mental health services.

Overall Patterns of Use

According to recent national surveys (Regier et al, 1993b; Kessler et al., 1996), a total of about 15 percent of the U.S. adult population use mental health services in any given year. Eleven percent receive their services from either the general medical care sector or the specialty mental health sector, in roughly equal proportions. In addition, about 5 percent receive care from the human services sector, and about 3 percent receive care from the voluntary support network. (The overlap across these latter two sectors accounts for these figures totaling more than 15 percent.)

Slightly more than *half* of the 15 percent of the adult population that use mental health services have a diagnosable mental or addictive disorder (8 percent), while the remaining portion has a mental health problem (7 percent). Bearing in mind that 28 percent of the population have a diagnosable mental or substance abuse disorder, only about one-third with a diagnosable mental disorder receives treatment in 1 year (Figure 2-5). In short, this translates to the *majority* of those with a diagnosable mental disorder *not receiving* treatment.

Similarly, about 21 percent of the child and adolescent population use mental health services annually. Nine percent receive care from the health care sector, almost exclusively from the specialty mental health sector. Seventeen percent of the child and adolescent population receive care from the human services sector, mostly in the school system, yet there is much overlap with the health sector (again accounting for the sum being more than 21 percent). The distribution of those who do and do not currently meet diagnostic criteria for a mental disorder is similar to that for adults (Figure 2-6).

History of Mental Health Services

The history of mental health services in the United States has been chronicled by historian Gerald N. Grob in a series of landmark books from which this account is drawn (Grob, 1983, 1991, 1994). The origins of the mental health services system coincide with the colonial settlement of the United States. Individuals with mental illness were cared for at home until urbanization induced state governments to confront a problem that had been relegated largely to families. The states' response was to build institutions, known first as asylums and later as mental hospitals. When the Pennsylvania Hospital opened in Philadelphia in the mid-18th century, it had provisions for individuals with mental illness housed in its basement. Also in the mid-18th century, colonial Virginia was the first state to build an asylum for mentally ill citizens, which it constructed in its capital at Williamsburg. If not cared for at home or in asylums, those with mental illness were likely to be found in jails, almshouses, work houses, and other institutions. By the time of the Revolutionary War, the beginnings were in place for each of the four sectors of the de facto mental health system.

The origins of treatment for mental illness in the general medical/primary care sector can be traced to the Pennsylvania Hospital. The origins of specialty mental health care can be traced to the Williamsburg asylum. Home care, the most common response to mental illness, probably became a part of the voluntary support network, whereas the human services sector was by far the most common organized or institutional response, by placing individuals in almshouses (homes for the poor) and work houses. The first form of treatment—known as "moral treatment"—was not given until the very end of the 18th century, after the Revolutionary War.